Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Cable, Fiber, Equipment Costs*

BCM2	BCPM (CPM)
• Prices for Cable, Fiber, Switching, Circuit Equipment Are List Prices	• Prices for all are Fully Installed Prices
• Further Price Adjustments Are Available As User Inputs	• Adjustments remain available as user inputs
• Used Loading Factors	• No loading factors needed (included in base price)
• Copper 24 & 26 Gauge	• Same
• Buried Cable Armored & Filled	• Same

Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Structure Costs*

BCM2

- Costs Calculated Outside Model
- Cost Per Foot

  (All Inclusive)

BCPM

- Calculated inside model
- Cost calculated # units

Materials

- # poles
- # guys
- # manholes
- # ducts

Spacing Inputs

Placement Costs

Sharing by Unit

Benchmark Cost Proxy Model

Example of Structure Inputs

	Underground Normal								
Density Group 0-10	**Install**	**Feeder**			**Distribution**				
Conduit Installation	Cost per Unit	% of Activity	% Assigned Telephone	Weighted Amount	% of Activity	% Assigned Telephone	Weighted Amount		
Trench & Backfill	$ 2.27	67.00%	100.00%	$ 1.52	79.00%	100.00%	$ 1.79		
Rocky Trench	$ 4.22	0.00%	100.00%	$ -	0.00%	100.00%	$ -		
Backhoe Trench	$ 2.70	17.00%	100.00%	$ 0.46	5.00%	100.00%	$ 0.14		
Hand Dig Trench	$ 4.99	2.00%	100.00%	$ 0.10	2.00%	100.00%	$ 0.10		
Boring	$ 11.80	2.00%	100.00%	$ 0.24	2.00%	100.00%	$ 0.24		
Cut & Restore Asphalt	$ 8.72	5.00%	100.00%	$ 0.44	5.00%	100.00%	$ 0.44		
Cut & Restore Concrete	$ 9.63	5.00%	100.00%	$ 0.48	5.00%	100.00%	$ 0.48		
Cut & Restore Sod	$ 3.75	2.00%	100.00%	$ 0.08	2.00%	100.00%	$ 0.08		
Total Underground Cost per Foot		100.00%		$3.31	100.00%		$3.26		

Feeder & Distribution Plant Distance

- Determination of Quadrant for Feeder Plant
- Utilizes Tree and Branch Topology
- SCS Slope Measurements Trigger Distance Adjustments
- Distribution Plant Calculations Based on Size of CBGs After Using Road Network to Reduce Size to Populated CBG Area

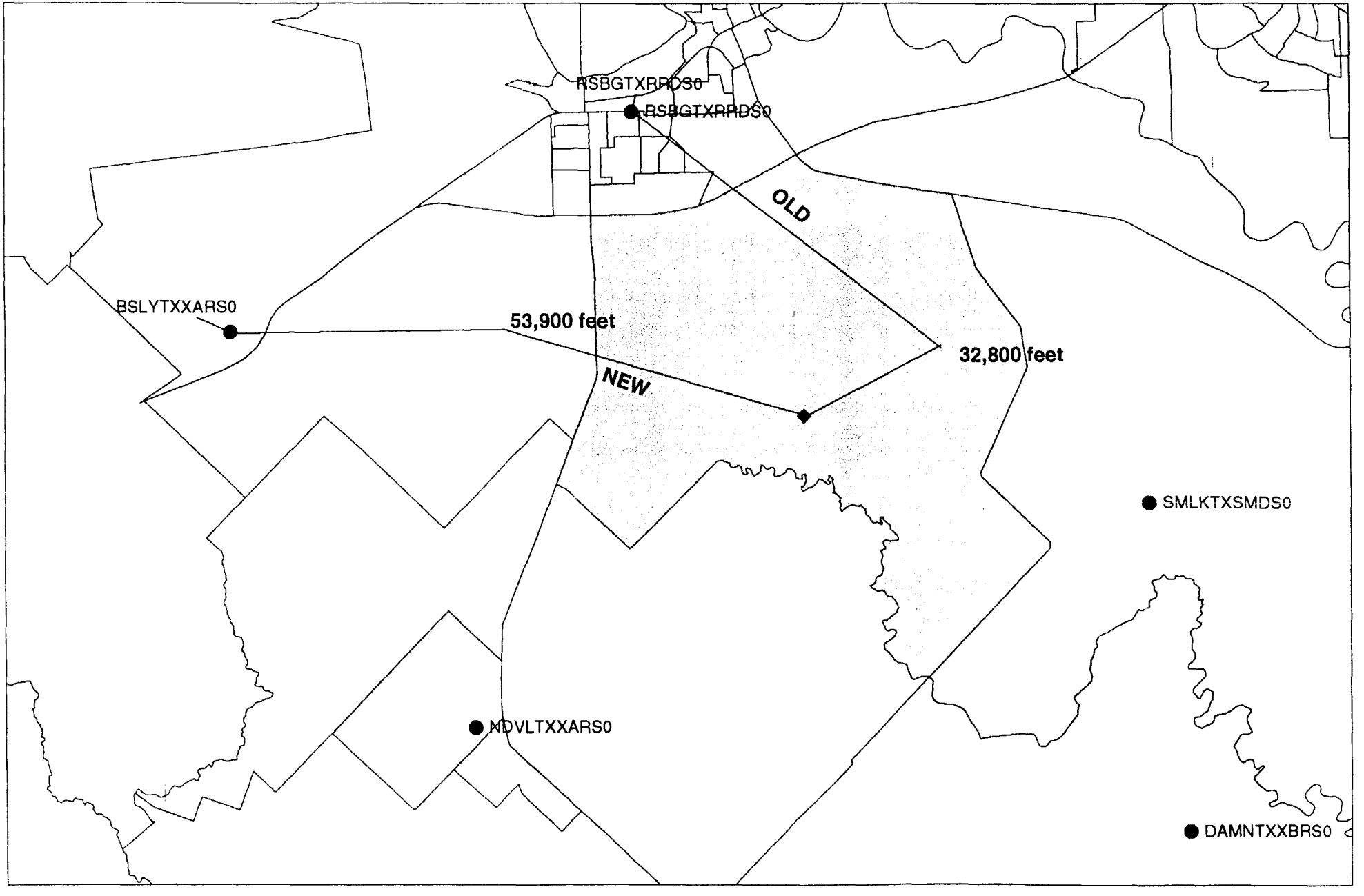
Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Feeder and Distribution Plant Distance*

BCM2: Feeder Plant Calculations Based on Airline Distance Between CBG and Closest Central Office.

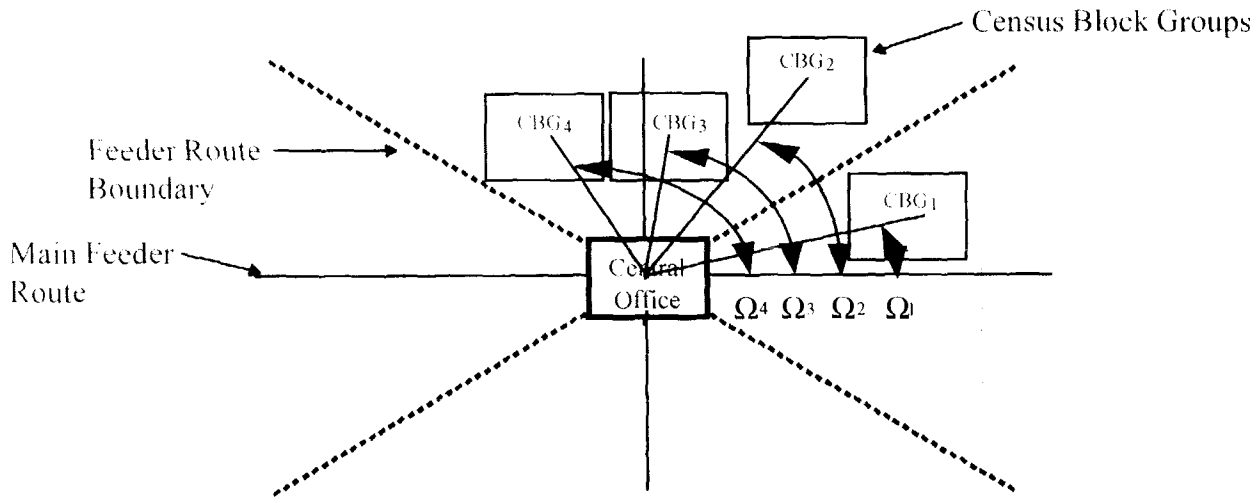
CPM: Distance Calculated on Correct Serving Entity Per Grid.

BCPM: Calculations Based on Airline Distance Between CBG and Correct Serving Entity.

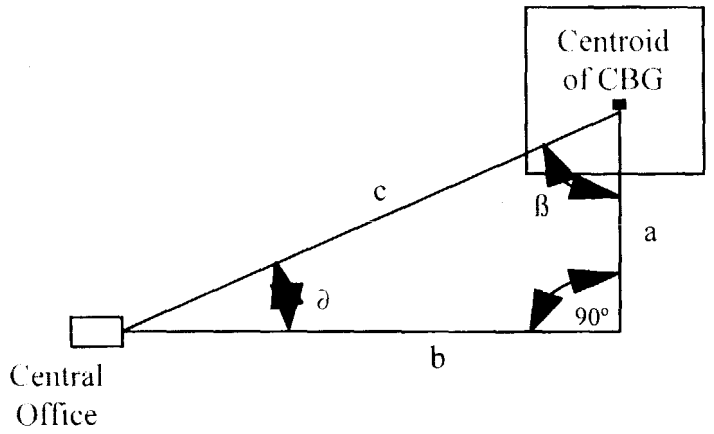

RSBGTXRRDS0
RSBGTXRRDS0
OLD
BSLYTXXARS0
53,900 feet
32,800 feet
NEW
SMLKTXSMDS0
NDVLTXXARS0
DAMNTXXBRS0

Benchmark Cost Proxy Model

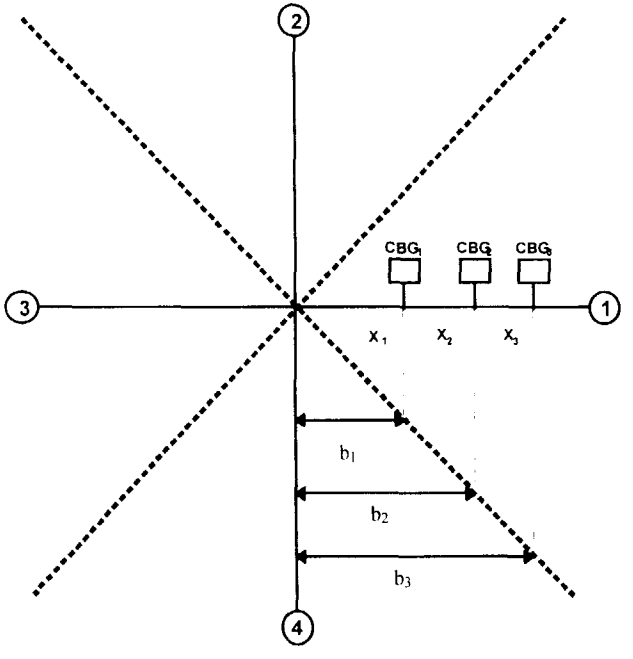
Determination of Feeder Quadrant



Feeder Distance Calculation



Shared Feeder Distance Calculation



Feeder & Distribution Cable Size

- Each Feeder Segment Cable Size Determined From Segment Capacity
- If Max Size Cable < Pairs Required, Then 1 or More Max Size Cables Plus a Residual Cable Sized to Meet or Exceed Capacity
- Fiber Cable Table (# Strands)

  12, 18, 24, 36, 48, 60, 72, 96, 144, 288
- Copper Cable Table (# Pairs)

  (12 Dist. Only), 25, 50, 100, 200, 400, 600, 900, 1200, 1800, 2400, 3000, 3600, (4200 Feeder Only).

Benchmark Cost Proxy Model

Cable Capacity for Shared Feeder Plant

- **Copper**
  - Sum of Lines Riding Feeder Segment/Segment Fill Factor
- **Fiber For DLC-L (4 Fibers Until Capacity Is Exceeded)**
  - 4 Fibers For Capacity Up to 2016 VG Paths
  - 4 Additional Fibers For Each Increment of 2016 VG Path
- **Fiber For DLC-S (4 Fibers Until Capacity Is Exceeded)**
  - 4 Fibers For Capacity Up to 672 VG Paths
  - 4 Additional Fibers For Each Increment of 672 VG Paths

Feeder Segment and Distribution Cable Costs

- Feeder Segment Cost = Segment Distance * Cable Cost Per Foot

- Distribution Cable Cost = Horizontal Distribution Plant Distance * Horizontal Distribution Leg Cost Per Foot * Number of Distribution Legs + Vertical Distribution Plant Distance * Vertical Distribution Leg Cost Per Foot * Number of Vertical Distribution Legs

Benchmark Cost Proxy Model

Circuit Equipment Costs

- Fixed Digital Subscriber Loop Carrier Electronics Remote Terminal Cost Per Line =

Fixed Terminal Cost

48 Line Terminal =	$ 38,688
120 Line Terminal =	$ 53,577
240 Line Terminal =	$ 84,976
672 Line Terminal =	$ 92,147
1334 Line Terminal =	$ 125,120
2016 Line Terminal =	$ 217,267

- Per line Cost: $92.81
- Per Line Costs Include Remote Terminal Line Cards, Shelves, Virtual Tributary Units

Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Switching Technology & Costs*

Previously, in BCM2:

- 5 Sizes: Remote; Under 10,000; 10,000-60,000; 60,000-100,000; Over 100,000 Lines
- Split Between Common Costs and Per Line Costs

Previously, in CPM:

- Based on Single Cost Curve Representing Fixed and Variable Costs.

Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Switching Technology & Costs*

New in BCPM:

- Capability for Small, Medium, Large Company Costs Curves
- Split Between Fixed and Variable Costs
- Data Based on Industry Data Request of SCIS-Type Data
- Regression Analysis Used to Obtain Curve Results by Company Type
- No Statistically Significant Differences Found Between Host and Remote Switches

BCPM Switching Costs

Cost Per Line for Local Switching =

[(Total Fixed Cost/Working Line Size) +

(Variable and Semi-Variable Costs/Switch Fill)] * % Local * Switch Discount * Local Engineering * Power & Common

Benchmark Cost Proxy Model

Changes in Annual Costs/Expenses Previously in BCM2

- **Investment Related Includes...**

  Return (11.25%) Depreciation (ARMIS Factor)

  Taxes Plant Specific Expenses

  Plant Non-Specific Expenses

- **Calculated for Three (3) Investment Categories:**

  Cable and Wire, COE Switching, COE Circuit

- **Non-Plant Related Expense Factor**

  ARMIS Expense Per Access Line:

  Customer Operations (Marketing & Service), Corporate Operations, Other Depreciation/Amortization

  Reduced to Reflect Local Service Only Expense, Default Factor 75%

Benchmark Cost Proxy Model

From BCM2/CPM to BCPM:
Annual Costs/Expenses
New in <u>BCPM</u>

- **Investment Related Factors Include Only (CPM):**
  - Return
  - Taxes
  - Depreciation (Economic)
- **Nineteen (19) Investment Categories (CPM)**
- **Calculated in *Cost of Capital Module***

Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Cost of Capital*

- Static Model
- External
- Part of Larger Factor, Non-Independent
- No Ease of Modification or Adjustment
- Combined Calculations

- Dynamic model
- Complete user control of inputs, e.g.
  - lives
  - cost of equity/debt
  - debt ratio
- Based upon FCC and State approved methodology, e.g.
  - deferred taxes
  - survivor curves
  - future net salvage

Pacific Bell, Sprint, U S WEST

Benchmark Cost Proxy Model

Detailed Annual Charge Accounts

- Land
- Motor Vehicle
- Special Purpose Vehicle
- Garage Work
- Other Work
- Building
- Furniture
- Office Support
- G.P. Computers
- Switching
- Circuit/DLC
- Pole
- Aerial Copper
- Aerial Fiber
- Underground Copper
- Underground Fiber
- Buried Copper
- Buried Fiber
- Conduit

Benchmark Cost Proxy Model

Changes From BCM2/CPM to BCPM: *Operating Expenses*

- Increased Level of Detail Which Yield Better Insight Into Drivers of Cost (CPM)
- Operating Expense Per Access Line (CPM)
- Reflects Forward Looking Expenses Based Only for Basic Service Based on Sample of LECs

Benchmark Cost Proxy Model

BCPM Expense Input Categories

- Network Support
- General Support
- COE Switching
- Operator Systems
- COE Transmission
- Information Orig/Term
- Cable & Wire Facilities
- Other Property Plant
- Network Operations
- Access
- Marketing
- Services
- Executive & Planning
- General and Administrative
- Uncollectibles

Benchmark Cost Proxy Model

BCPM Highlights:

Openness

All Calculations/Equations Visible for Inspection

All Inputs Easily Verified

Flexibility

User Inputs Easily Changed

Numerous Reporting Levels Available

-CBG, Exchange, CLLI, State

Ease of Use

Easily Accessed and Executed

Drop-Down Menus, New Screens

Hardware Requirements

24 MB RAM / 486 PC Machine Will Run Model

BCPM Highlights

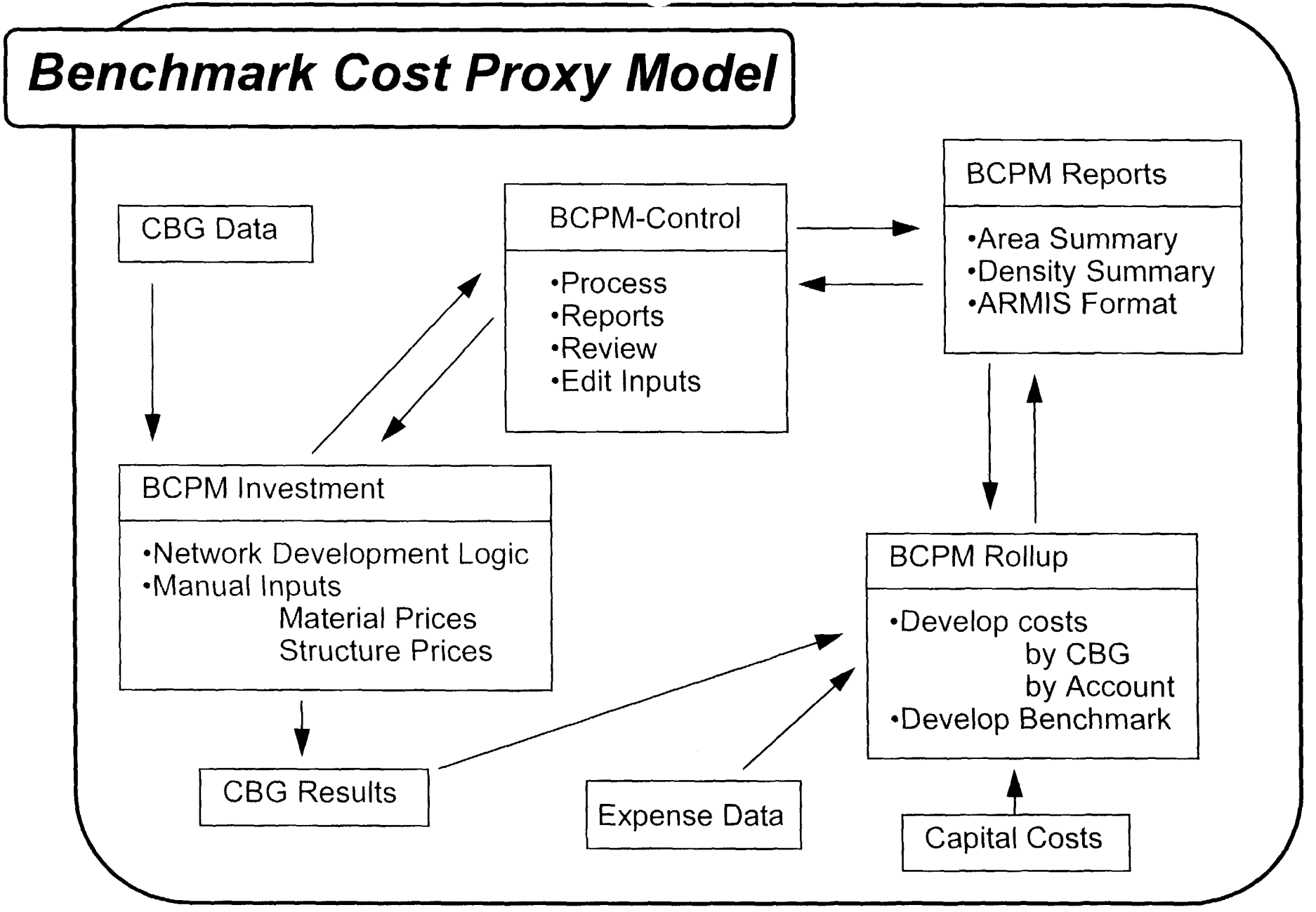
- Integrated Modeling Approach-

  Workbook, Input Data, Etc. Combined to Create "Processing" Model

- Multi-State Processing Possible With 1 Input File Per State

- Ability to Selectively Review Results at Any Time

Benchmark Cost Proxy Model



Pacific Bell, Sprint, U S WEST